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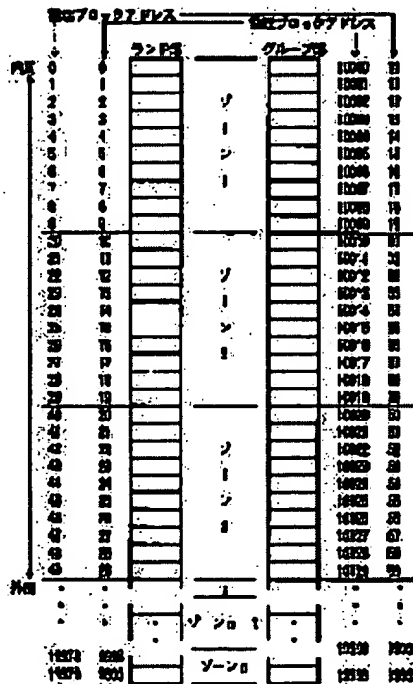
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## (54) INFORMATION PROCESSING DEVICE AND RECORDING MEDIUM SUITABLE FOR THE DEVICE

(57)Abstract:

**PROBLEM TO BE SOLVED:** To provide an information processing and a corresponding optical disk capable of reproducing information respectively recorded on a land and a groove without a pause.

**SOLUTION:** The information processing device imparts a logical address capable of changeing over a land and a groove to every zone divided by making prescribed number of blocks as unit to physical addresses inherent in an optical disk. Consequently, a lens actuator positioned at the block having the physical address 0 of the land of a zone 1 is moved to the block having the physical address 10000 of the groove of the zone 1 next to the block having the physical address 9 and is guided to the physical address 10009 of the groove of the zone 1 and further, is moved to the block having the physical address 10 of the land of a zone 2. Subsequently, information are reproduced in the order of the groove of the zone 2, the land of a zone 3 and the groove of the zone 3.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The information processor which has the reading control means which reads reading of the information from the record medium by reading means to read the information memorized by the record medium which has the 1st record section divided into two or more partitions by making predetermined capacity into a unit, and the 2nd record section, and this reading means so that it may become an array which is different from the array of the partition of a proper in a record medium, and changes order.

[Claim 2] The information processor which has a reading means to read the information memorized by the record medium which has the 1st record section divided into two or more partitions by making predetermined capacity into a unit, and the 2nd record section, and the reading control means which changes reading of the information from the record medium by this reading means 2nd the above 1st and between record sections for two or more above-mentioned partitions of every.

[Claim 3] The information processor which has the reading control means changed 2nd the above 1st and between record sections by making into a unit at least one partition of two or more above-mentioned partitions of reading of the information from the record medium by reading means to read the information memorized by the record medium which has the 1st record section divided into two or more partitions by making predetermined capacity into a unit, and the 2nd record section, and this reading means.

[Claim 4] A reading means to divide and read the information currently recorded on each of the 1st field of a record medium, and the 2nd field in a predetermined unit, The management tool which manages the order of read of the information on the 1st and 2nd fields of the above by this reading means with the permutation which was able to be decided beforehand, The information processor which has the 1st control means which makes the above-mentioned reading means focus to each of the 1st and 2nd fields of the above, and the 2nd control means to which the above-mentioned reading means is moved according to spacing at which each of the 1st and 2nd fields of the above is arranged.

[Claim 5] The record medium which has the 1st record section where it is divided into two or more partitions by making predetermined capacity into a unit, and discontinuous management information is given to each partition, and the 2nd record section where it is divided into two or more partitions by making predetermined capacity into a unit, and discontinuous management information is given to each partition.

[Claim 6] The record medium which has the 2nd record section where the management information it can consider that is the partition which was divided into two or more partitions by having made predetermined capacity into the unit, was divided into two or more partitions by having made into the unit the 1st record section where the management information it can be considered that is the partition which followed each partition in the partition of a predetermined number is given, and predetermined capacity, and followed each partition in the partition of a predetermined number is given.

[Claim 7] The 1st record section where the management information which is divided into two or more partitions by making predetermined capacity into a unit, and can consider to each partition that at least one partition is the partition which continued as a unit is given, The 2nd record section where the

management information which is divided into two or more partitions by making predetermined capacity into a unit, and can consider to each partition that at least one partition is the partition which continued as a unit is given, The record medium characterized by specifying the order of playback by the regenerative apparatus while \*\*\*\*(ing) and displaying the management information of the 1st record section of the above, and the management information of the 2nd record section of the above in predetermined order.

[Claim 8] The lens which takes out the reflected light reflected with the record medium while the 1st and 2nd record sections managed by two or more partitions divided by predetermined capacity irradiate light at the record medium formed in the same field, The photodetector which changes into an electrical signal the reflected light taken out with this lens, The lens location amendment device which amends the relative position of the above-mentioned lens to each of the 1st and 2nd record sections of a record medium based on the output from this photodetector, The lens migration device which moves this lens location amendment device along the 1st and 2nd record sections of a record medium, The information processor which has the control unit to which the above-mentioned lens migration device is moved in different order from the array of the proper of the partition continuously given in each of the 1st and 2nd record sections of a record medium.

[Claim 9] The lens which takes out the reflected light reflected with the record medium while the 1st and 2nd record sections managed by two or more partitions divided by predetermined capacity irradiate light at the record medium formed in the same field, The photodetector which changes into an electrical signal the reflected light taken out with this lens, The lens location amendment device which amends the relative position of the above-mentioned lens to each of the 1st and 2nd record sections of a record medium based on the output from this photodetector, The lens migration device which moves this lens location amendment device along the 1st and 2nd record sections of a record medium, The information processor which has the control unit to which the above-mentioned lens migration device is moved so that the light irradiated by the record medium with the above-mentioned lens may be irradiated by each partition of the 1st and 2nd record sections of a record medium in predetermined order.

[Claim 10] The record medium which has the land by which it is divided into two or more partitions by making predetermined capacity into a unit, and discontinuous management information is given to each partition, and the groove section by which it is divided into two or more partitions by making predetermined capacity into a unit, and discontinuous management information is given to each partition.

[Claim 11] The record medium which has the groove section to which the management information it can consider that is the partition which was divided into two or more partitions by having made predetermined capacity into the unit, was divided into two or more partitions by having made into the unit the land to which the management information it can be considered that is the partition which followed each partition in the partition of a predetermined number is given, and predetermined capacity, and followed each partition in the partition of a predetermined number is given.

[Claim 12] The land to which the management information which is divided into two or more partitions by making predetermined capacity into a unit, and can consider to each partition that at least one partition is the partition which continued as a unit is given, The groove section to which the management information which is divided into two or more partitions by making predetermined capacity into a unit, and can consider to each partition that at least one partition is the partition which continued as a unit is given, The record medium characterized by specifying the order of playback by the regenerative apparatus while \*\*\*\*(ing) and displaying the management information of the above-mentioned land, and the management information of the above-mentioned groove section in predetermined order.

[Claim 13] The lens which takes out the reflected light reflected with the record medium while the land and the groove section which are managed by two or more partitions divided by predetermined capacity irradiate light at the record medium formed in the same field, The photodetector which changes into an electrical signal the reflected light taken out with this lens, The lens location amendment device which amends the relative position of the above-mentioned lens to each of the land of a record medium, and

the groove section based on the output from this photodetector, The lens migration device which moves this lens location amendment device along with the land and the groove section of a record medium, The information processor which has the control unit to which the above-mentioned lens migration device is moved so that the light irradiated by the record medium with the above-mentioned lens may be irradiated by each partition of the land of a record medium, and the groove section in predetermined order.

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**DETAILED DESCRIPTION**

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**[Detailed Description of the Invention]****[0001]**

**[Industrial Application]** This invention relates to the optical disk suitable for the information record regenerative apparatus which reproduces information from an optical disk, and this information record regenerative apparatus while recording information on an information processor and the optical disk which has a predetermined format especially.

**[0002]**

**[Description of the Prior Art]** The optical disk as a record medium is the groove beforehand formed in the recording surface. (guide rail) Lands other than a groove (field field) It has. Moreover, many information record regenerative apparatus are controlled to record any of the land of an optical disk, or a groove, or information.

**[0003]** By the way, since recording density is increased, there is the approach of recording information on the both sides of a groove and a land. However, when recording information on the both sides of a groove and a land, it originates in the depth of a groove, i.e., the distance between a land and a groove, and focusing of an objective lens must be changed.

**[0004]** When recording information from this, information is recorded on a land, or any of a groove and a land towards the outermost periphery from the most inner circumference, then a head is returned to the most inner circumference, and information is recorded towards the outermost periphery from the most inner circumference, the remaining record sections, i.e., groove. In addition, when reproducing information, the order shown by the index is reproduced based on the index recorded on Read Inn Elian at the time of record.

**[0005]**

**[Problem(s) to be Solved by the Invention]** As mentioned above, information is recorded on each of a land and a groove. (or each to information playback) A head is a land when carrying out. (groove) When the outermost periphery is reached, while returning a head to the most inner circumference, it is necessary to change focusing and tracking.

**[0006]** This is recorded. (playback) Record since migration of a head is produced on the way (playback) There is a problem on which required time amount increases temporarily. Moreover, when the information which is the case where migration of a head arises and is reproduced at the time of playback is the continuous image etc., for example, an image will break off.

**[0007]** In addition, in order to prevent that information breaks off at the time of playback, while the memory for the time amount concerning migration of a head is prepared and a head moves, the approach of outputting the information stored in memory is proposed, but since the memory for recording an image must be large capacity, it has the problem on which cost increases.

**[0008]** The purpose of this invention is about the information recorded on each of a land and a groove to offer a refreshable information record regenerative apparatus [ be / no break ] and a corresponding optical disk.

**[0009]**

[Means for Solving the Problem] The information processor of this invention is what was made based on the trouble mentioned above. A reading means to read the information memorized by the record medium which has the 1st record section divided into two or more partitions by making predetermined capacity into a unit, and the 2nd record section, It is characterized by having the reading control means which reads reading of the information from the record medium by this reading means so that it may become an array which is different from the array of the partition of a proper in a record medium, and changes order.

[0010] Moreover, this invention offers the information processor which has a reading means to read the information memorized by the record medium which has the 1st record section divided into two or more partitions by making predetermined capacity into a unit, and the 2nd record section, and the reading control means which changes reading of the information from the record medium by this reading means 2nd the above 1st and between record sections for two or more above-mentioned partitions of every.

[0011] Furthermore, a reading means to read the information memorized by the record medium which has the 1st record section which this invention made predetermined capacity the unit and was divided into two or more partitions, and the 2nd record section, The information processor which has the reading control means changed 2nd the above 1st and between record sections by making at least one partition of two or more above-mentioned partitions of reading of the information from the record medium by this reading means into a unit is offered.

[0012] Furthermore, the reading means which this invention divides the information currently recorded on each of the 1st field of a record medium, and the 2nd field in a predetermined unit, and is read, The management tool which manages the order of read of the information on the 1st and 2nd fields of the above by this reading means with the permutation which was able to be decided beforehand, The information processor which has the 1st control means which makes the above-mentioned reading means focus to each of the 1st and 2nd fields of the above, and the 2nd control means to which the above-mentioned reading means is moved according to spacing at which each of the 1st and 2nd fields of the above is arranged is offered.

[0013] This invention is divided into two or more partitions by making predetermined capacity into a unit, and offers the record medium which has the 1st record section where discontinuous management information is given to each partition, and the 2nd record section where it is divided into two or more partitions by making predetermined capacity into a unit, and discontinuous management information is given to each partition further again.

[0014] Furthermore, the 1st record section where the management information it can be considered that is the partition which this invention made predetermined capacity the unit, was divided into two or more partitions, and followed each partition in the partition of a predetermined number is given, It is divided into two or more partitions by making predetermined capacity into a unit, and the record medium which has the 2nd record section where the management information it can be considered that is the partition which followed each partition in the partition of a predetermined number is given is offered.

[0015] The 1st record section where the management information which this invention makes predetermined capacity a unit, is divided into two or more partitions, and can consider to each partition that at least one partition is the partition which continued as a unit is given further again, The 2nd record section where the management information which is divided into two or more partitions by making predetermined capacity into a unit, and can consider to each partition that at least one partition is the partition which continued as a unit is given, It \*\*\*\*, and while the management information of the 1st record section of the above and the management information of the 2nd record section of the above are displayed in predetermined order, the record medium characterized by specifying the order of playback by the regenerative apparatus is offered.

[0016] Furthermore, the lens which takes out the reflected light reflected with the record medium while this invention irradiates light at the record medium with which the 1st and 2nd record sections managed by two or more partitions divided by predetermined capacity were formed in the same field, The photodetector which changes into an electrical signal the reflected light taken out with this lens, The lens location amendment device which amends the relative position of the above-mentioned lens to each of

the 1st and 2nd record sections of a record medium based on the output from this photodetector, The lens migration device which moves this lens location amendment device along the 1st and 2nd record sections of a record medium, The information processor which has the control unit to which the above-mentioned lens migration device is moved in different order from the array of the proper of the partition continuously given in each of the 1st and 2nd record sections of a record medium is offered.

[0017] The lens which takes out the reflected light reflected with the record medium further again while this invention irradiates light at the record medium with which the 1st and 2nd record sections managed by two or more partitions divided by predetermined capacity were formed in the same field, The photodetector which changes into an electrical signal the reflected light taken out with this lens, The lens location amendment device which amends the relative position of the above-mentioned lens to each of the 1st and 2nd record sections of a record medium based on the output from this photodetector, The lens migration device which moves this lens location amendment device along the 1st and 2nd record sections of a record medium, The information processor which has the control unit to which the above-mentioned lens migration device is moved so that the light irradiated by the record medium with the above-mentioned lens may be irradiated by each partition of the 1st and 2nd record sections of a record medium in predetermined order is offered.

[0018] Furthermore, this invention is divided into two or more partitions by making predetermined capacity into a unit, and offers the record medium which has the land by which discontinuous management information is given to each partition, and the groove section by which it is divided into two or more partitions by making predetermined capacity into a unit, and discontinuous management information is given to each partition.

[0019] The land to which the management information it can be considered that is the partition which this invention made predetermined capacity the unit, was divided into two or more partitions, and followed each partition in the partition of a predetermined number is given further again, It is divided into two or more partitions by making predetermined capacity into a unit, and the record medium which has the groove section to which the management information it can be considered that is the partition which followed each partition in the partition of a predetermined number is given is offered.

[0020] Furthermore, the land to which the management information which this invention makes predetermined capacity a unit, is divided into two or more partitions, and can consider to each partition that at least one partition is the partition which continued as a unit is given, The groove section to which the management information which is divided into two or more partitions by making predetermined capacity into a unit, and can consider to each partition that at least one partition is the partition which continued as a unit is given, It \*\*\*, and while the management information of the above-mentioned land and the management information of the above-mentioned groove section are displayed in predetermined order, the record medium characterized by specifying the order of playback by the regenerative apparatus is offered.

[0021] The lens which takes out the reflected light reflected with the record medium further again while this invention irradiates light at the record medium with which the land and the groove section which are managed by two or more partitions divided by predetermined capacity were formed in the same field, The photodetector which changes into an electrical signal the reflected light taken out with this lens, The lens location amendment device which amends the relative position of the above-mentioned lens to each of the land of a record medium, and the groove section based on the output from this photodetector, The lens migration device which moves this lens location amendment device along with the land and the groove section of a record medium, The information processor which has the control unit to which the above-mentioned lens migration device is moved so that the light irradiated by the record medium with the above-mentioned lens may be irradiated by each partition of the land of a record medium and the groove section in predetermined order is offered.

[0022]

[Embodiment of the Invention] Hereafter, the gestalt of implementation of this invention is explained, referring to a drawing. As shown in drawing 1, the optical disk as an information record medium has the recording surface formed on the base material which is not explained in full detail.



[0023] Groove formed in the recording surface in the predetermined pitch at the spiral or the concentric circle (it becomes a crevice to the front face of a recording surface) It is arranged. In addition, the field, i.e., the field of thickness in general equal to the front face of a recording surface, where a groove does not exist is called the land.

[0024] The recording surface is classified into the calibration field, the lead-in groove field, the record section, and the lead-out field sequentially from the core side. The pit train which shows the address number of the physical format to which the specific permutation later mentioned using drawing 4 and drawing 5 was given and which is not illustrated is formed in the land of the record section of a recording surface, and each of a groove. In case an optical disk is manufactured, a reflection factor changes with stamp rings etc., and this pit train is called the preformat as everyone knows.

[0025] Drawing 2 is a partition which is what developed in the shape of a straight line, and showed typically the land and groove of a recording surface of an optical disk which were shown in drawing 1, and is used in case each of a land and a groove records information on an optical disk. (break) The example is shown.

[0026] As shown in drawing 2, each of a land and a groove is managed as a block for every storage capacity decided beforehand, for example, the die length divided considering 1 K byte as a unit. Moreover, each block is managed as a zone by making the predetermined block count, for example, 10-100 blocks, into a unit.

[0027] In addition, the number of the blocks per zone can be changed into arbitration. Moreover, the number of the blocks per one zone is, the optical head 2 10 (lens actuator 12), i.e., the objective lens, shown in drawing 3 in the seeking control later mentioned using drawing 4 and drawing 5. It is specified that the both sides of the switching time for focusing and the tracking which are needed for the change to a land from a groove or a groove from the time amount demanded in order to move in a zone, and a land become min.

[0028] Drawing 3 is the outline block diagram showing an example of the information record regenerative apparatus which records information on the optical disk shown in drawing 1 and drawing 2, and reproduces information from an optical disk. As shown in drawing 3, it has the optical head 2 which reproduces the information currently recorded on optical disk D, the motor 4 which rotates optical disk D at the rate of predetermined, many control circuits explained in full detail in the latter part, a drive circuit, etc. while the information record regenerative apparatus 100, i.e., an optical disk unit, records information on the recording surface of optical disk D as a record medium.

[0029] The optical head 2 is a laser beam from the semiconductor laser component mentioned later. (light) While irradiating, the slide base 14 which holds the lens actuator 12 which holds the objective lens 10 which takes out the reflective laser beam reflected by the recording surface of optical disk D, and an objective lens 10 movable in the recording surface of optical disk D and the direction which counters, and the lens actuator 12 movable in the direction of a path of an optical disk is included.

[0030] The lens actuator 12 has tracking coil 12c for moving focal coil 12b for making the approach of intersecting perpendicularly with the recording surface of optical disk D move mirror 12a which shows an objective lens 10 to the laser beam from the semiconductor laser component mentioned later, and an objective lens 10, and an objective lens 10 in the direction of a path of optical disk D along with the recording surface of optical disk D.

[0031] A slide base 14 is held at the linear motor 16 which consists of the magnetism generating section and the guide shaft which are not illustrated, and is moved in the direction of a path of optical disk D in the shape of a straight line through a linear motor 16.

[0032] A linear motor 16 is a scale which is not explained in full detail. (location detection device) It contains and the position signal for reporting the current position is outputted to the control unit mentioned later. Semiconductor laser component fixed through the holddown member which is not illustrated so that it may turn to mirror 12a of the lens actuator 12 and the direction of the plane of polarization of a laser beam may be in agreement with the location which can irradiate a laser beam in the predetermined direction (it is hereafter indicated as a laser component) 30 is arranged.

[0033] Between the lens actuator 12 and the laser component 30, while showing the laser beam which

had the collimate lens 32 which fabricates the cross-section configuration of the laser beam by which outgoing radiation was carried out from laser 30 in predetermined magnitude, and the collimate lens 32 passed to the recording surface of optical disk D, the beam splitter 34 which separates the reflective laser beam reflected by the recording surface from the light which goes to optical disk D is arranged.

[0034] In the direction to which it is shown to the reflective laser beam separated by the beam splitter 34, the photodetector 38 which changes into the electrical signal corresponding to optical reinforcement the lens unit 36 which gives a predetermined optical property at the reflective laser beam separated by the beam splitter 34, and the reflective laser beam reflected by the recording surface is arranged.

[0035] The optical disk unit 100 has the main control unit 102, i.e., CPU. CPU102 has CPU memory 102a on which the bootstrap is recorded beforehand.

[0036] The memory unit 106 is connected to CPU102 through the internal bus line 104. The memory unit 106 is an expanded memory which holds temporarily control data or the address inputted through buffer memory 106a which holds temporarily the information read from the information or optical disk D which should be recorded on optical disk D, and the host computer which is not illustrated. (random access memory, RAM) 106b is included.

[0037] The laser control circuit 110 controls the optical reinforcement of the laser beam by which outgoing radiation is carried out from the laser component 30 according to each of the data which should be recorded, record, or playback based on directions of CPU102 connected by the internal bus line 104.

[0038] The linear motor control circuit 112 drives a linear motor 16 so that a slide base 14 10, i.e., an objective lens, may serve as a position. In addition, the linear motor control circuit 112 is an input-output control circuit. (it is hereafter indicated as an I/O-hardware-control circuit) It connects with CPU102 through 124, and based on the positional information from the scale of a linear motor 16, it asks by CPU102, and a linear motor 16 is energized in the predetermined direction based on the controlled variable outputted from CPU102 corresponding to the distance which should move.

[0039] The video signal processing circuit 114 is made binary in order to reproduce the output signal corresponding to the optical reinforcement of the reflective laser beam from the recording surface of optical disk D by which photo electric conversion was carried out with the photodetector 38 as information currently recorded on optical disk D, and it is supplied to the predetermined field of buffer memory 106a in the memory unit 106.

[0040] The focal control circuit 116 is supplying a predetermined current to focal coil 12b based on the output corresponding to the optical reinforcement of the reflective laser beam from optical disk D by which photo electric conversion's was carried out with the photodetector 38, and in order to make spacing of an objective lens 10 and the recording surface of optical disk D in agreement with the focal distance of an objective lens 10, it moves an objective lens 10. In addition, it connects with CPU102 through the I/O-hardware-control circuit 124, and the focal control circuit 116 supplies the current of a predetermined direction to focal coil 12b based on the controlled variable outputted by CPU102 corresponding to the amount which should move an objective lens 10.

[0041] The tracking control circuit 118 moves an objective lens 10 in order to make in agreement the core of the light which had the objective lens 10 passed based on the output corresponding to the optical reinforcement of the reflective laser beam from optical disk D by which photo electric conversion was carried out with the photodetector 38, the groove of an optical disk, or the core of a land. In addition, it connects with CPU102 through the I/O-hardware-control circuit 124, and the tracking control circuit 118 supplies the current of a predetermined direction to truck coil 12c based on the controlled variable outputted from CPU102 corresponding to the amount which should move an objective lens 10.

[0042] A modulation / demodulator circuit 120 restores to the signal outputted as a binary signal via the video signal processing circuit 114, when changing the optical reinforcement of the laser beam by which outgoing radiation is carried out from the laser component 30 based on the information which was recorded on buffer memory 106a, and which should be recorded when recording information on optical disk D and reproducing information from optical disk D.

[0043] Based on directions of CPU102, the motorised circuit 122 rotates a motor 4 at the rate of predetermined, and rotates optical disk D at the rate of predetermined. The I/O-hardware-control circuit

124 drives the laser control circuit 110 to the predetermined timing set up through the timing control circuit 126, and it makes the binary signal taken out through the video signal processing circuit 114 store in buffer memory while carrying out outgoing radiation of the record laser beam from the laser component 30 towards optical disk D. The I/O-hardware-control circuit 124 makes the focal control circuit 116 and the truck control circuit 118 move an objective lens 10 in the predetermined direction again to the predetermined timing set up through the timing control circuit 126. The I/O-hardware-control circuit 124 sets up the passing speed and timing for moving the lens actuator 12 to the next target track on the basis of the current position and passing speed of the lens actuator 12 10, i.e., an objective lens, further called for by CPU102 based on the positional information supplied from the scale of a linear motor 16.

[0044] In addition, CPU102 is connected with the host computer which is not illustrated through a host interface 128. Next, actuation of the optical disk unit 100 shown in drawing 3 is explained.

[0045] If an optical disk unit 100 is started from the host computer which is not illustrated via a host interface 128, a predetermined drive current will be outputted by control of the I/O-hardware-control circuit 124 corresponding to the directions from CPU102 from the linear motor control circuit 112, a linear motor 16 will drive, and the lens actuator 12 10, i.e., an objective lens, will be moved to the calibration field by the side of the core of optical disk D shown in drawing 1.

[0046] If it is detected based on the positional information from the scale of a linear motor 16 that the objective lens 10 arrived at the calibration field, a predetermined controlled variable will be outputted to the laser control circuit 110 by control of the I/O-hardware-control circuit 124 corresponding to the directions from CPU102, and the laser drive current corresponding to a controlled variable will be supplied to the laser component 30 from the laser control circuit 110.

[0047] Thereby, outgoing radiation of the calibration beam of optical predetermined reinforcement is carried out from the laser component 30. This calibration beam passes a collimate lens 32 and a beam splitter 34, is guided by mirror 12a at an objective lens 10, and is irradiated by the calibration field of the recording surface of optical disk D.

[0048] Shortly, it is reflected in a calibration field and the calibration beam irradiated by the calibration field is returned to an objective lens 10. The calibration beam returned to the objective lens 10 is led to a beam splitter 34 by mirror 12a, and is reflected by the beam splitter 34.

[0049] Image formation of the calibration beam reflected by the beam splitter 34 is carried out in the beam-spot size to which the magnitude which a predetermined optical property is given by the lens unit 36, and is specified to the light-receiving side of a photodetector 38 with the focal distance of a proper at the distance and the objective lens 10 of a recording surface and an objective lens 10 was given.

[0050] The output current outputted from the photodetector 38 is hereafter supplied to the I/O-hardware-control circuit 124 from the focal control circuit 116, it is inputted into CPU102, and the condition of a focus / un-focusing, i.e., focusing, is judged by CPU102.

[0051] Then, the amount which should move an objective lens 10 by CPU102 is calculated, and this calculated movement magnitude is supplied to the I/O-hardware-control circuit 124. It considers as the controlled variable which should move an objective lens 10 from the I/O-hardware-control circuit 124 by this, a controlled variable is directed to the focal control circuit 116, and the focal control current corresponding to a controlled variable is supplied to focal control circuit 116 focus coil 12b.

[0052] At this time, the output current outputted from the photodetector 38 is the criteria track which was supplied also to the truck control circuit 118 and formed in the core and calibration field of an objective lens 10. (groove) The tracking of a between is detected.

[0053] Hereafter, the focal lock of the spacing of an objective lens 10 and the calibration field of an optical disk is carried out in the state of a focus by the calibration beam from the laser component 30. Then, while a tracking error is amended, it is the timing of a track jump by the timing control circuit 126. (interval) It is set up.

[0054] Next, a predetermined drive current is outputted by control of the I/O-hardware-control circuit 124 corresponding to the directions from CPU102 from the linear motor control circuit 112, a linear motor 16 drives, and the lens actuator 12 10, i.e., an objective lens, is moved to the lead-in groove field

of optical disk D shown in drawing 1.

[0055] If it is detected based on the positional information from the scale of a linear motor 16 that the objective lens 10 arrived at the lead-in groove field, the controlled variable for playback beams will be outputted to the laser control circuit 110 by control of the I/O-hardware-control circuit 124 corresponding to the directions from CPU102, and the laser drive current corresponding to a controlled variable will be supplied to the laser component 30 from the laser control circuit 110.

[0056] Thereby, outgoing radiation of the playback laser beam of optical predetermined reinforcement is carried out from the laser component 30. Hereafter, where the focal lock of the objective lens 10 is carried out in the state of a focus, a track jump is repeated and the index currently beforehand recorded on the lead-in groove field is read.

[0057] Next, a predetermined drive current is outputted by control of the I/O-hardware-control circuit 124 corresponding to the directions from CPU102 from the linear motor control circuit 112, a linear motor 16 drives, and the lens actuator 12 10, i.e., an objective lens, is moved to the data storage area of optical disk D shown in drawing 1.

[0058] Henceforth, according to the logical address of the data storage area currently recorded on the index, an objective lens 10 12, i.e., a lens actuator, is moved to the position of the recording surface of optical disk D, and information is reproduced for information by optical disk D from record or optical disk D.

[0059] By the way, information is recorded on the both sides of a groove and a land. (information is reproduced) With the approach of carrying out, it is a groove from a land. (from a groove to or a land) When changing, it is common knowledge that focusing of an objective lens 10 must be changed according to the distance of the pars basilaris ossis occipitalis of a groove and land on the basis of the depth, i.e., the land, of a groove. Moreover, the distance of a groove and a land is a groove from a groove. (from a land to a land) Since it is 1/2 of the distance of a between, the magnitude of a track jump must also be changed. From a land to namely, a groove (from a groove to a land) When changing, it will be necessary to amend focusing and the tracking of an objective lens 10.

[0060] Drawing 4 is record of the information which enables the change to a land from a groove or a groove from a land without being dependent on the regularity of the physical address given to optical disk D on the occasion of record of assignment of the logical address of the optical disk unit of this invention, i.e., the information on optical disk D, and playback of the information from optical disk D. (playback) The approach is shown.

[0061] The physical address given to the land of optical disk D and each of a groove so that the land and groove of a record section of optical disk D may interchange for every zone, if drawing 4 is referred to is the objective lens 10 (lens actuator 12) produced by the change of a land and a groove, when a zone is independently specified by making the block of a predetermined number into a unit and the logical address assigns. The seek time is made to min.

[0062] It records on a detail from the block of the physical address 0 of the land of a zone 1. (playback) The started lens actuator 12 is moved to the block of the physical address 10000 of the groove of the block of a physical address 9, next a zone 1.

[0063] The lens actuator 12 is succeedingly recorded from the block of the physical address 10000 of the groove of a zone 1. (playback) It starts and is moved to the block of the physical address 10 of the land of the block of a physical address 10009, next a zone 2.

[0064] Hereafter, information is recorded in order of the groove of a zone 2, the land of a zone 3, and the groove of a zone 3. (playback) It carries out. According to this approach, it is the lens actuator 12 (objective lens 10). Since the seek time which is needed in case it is returned in the direction of inner circumference from a periphery is [ only being restricted by the die length of one zone, and ], it is a groove from a land. (from a groove to a land) Record accompanied by a change (playback) Even if it is the case where it is generated, it records. (playback) Required time amount is reduced. Thereby, the capacity of buffer memory can be reduced to several [ 1/ ].

[0065] In addition, as already explained using drawing 2, the number of the blocks per one zone is an objective lens 10 (lens actuator 12). It is specified that the both sides of the switching time for focusing

and the tracking which are needed for the change to a land from a groove or a groove from the time amount demanded in order to return the record section for one zone, and a land become min.

[0066] Drawing 5 is the schematic diagram showing typically the seek operation shown in drawing 4. Without being dependent on the regularity of the physical address of optical disk D already explained using drawing 4 the change to a land from a groove or a groove from a land As [ be / by drawing 5 / clear ] (1) The land of zone n-i -1, (2) The groove section of zone n-i -1, (3) Land of zone n-i, (4) The groove section of zone n-i, (5) Land of zone n-i +1, (6) In order of the groove section of zone n-i +1, the land and groove of each zone are reproduced by turns.

[0067] That is, in the example shown in drawing 4 and drawing 5, the time amount required of the change to a land from a groove or a groove from a land becomes the shortest. Drawing 6 is a schematic diagram in which the seek operation shown in drawing 5 R> 5 shows different seek operation typically.

[0068] If drawing 6 is referred to, the change to a land from a groove or a groove from a land (1) The land of the zone connected to the preceding paragraph of the land of zone n-i -1, and the land of zone n-i -1, (2) The groove section of zone n-i -1, and the groove section of zone n-i, (3) The land of zone n-i, and the land of zone n-i +1, (4) In order of the groove section of the zone connected to the latter part of the groove section of zone n-i +1, and the groove section of zone n-i +1, the land and groove of each zone are reproduced by turns in the condition of having connected in the predetermined unit.

[0069] Drawing 7 is the modification of assignment of the logical address shown in drawing 4, and as shown in drawing 6, it shows the example of the logical address of optical disk D formed in the condition that the land and groove of each zone were connected in the predetermined unit.

[0070] If drawing 7 is referred to, the logical address will be assigned so that it may be exchanged considering the zone where the change to the land of the record section of optical disk D and a groove continued at least as a unit.

[0071] It records on a detail from the block of the physical address 0 of the land of a zone 1. (playback) The started lens actuator 12 is moved to the block of the physical address 10000 of the groove of the block of a physical address 9, next a zone 1.

[0072] The lens actuator 12 is succeedingly recorded from the block of the physical address 10000 of the groove of a zone 1. (playback) It starts and is moved to the block of the physical address 10010 of the groove of the block of a physical address 10009, next a zone 2.

[0073] Hereafter, information is recorded in order of the land of a zone 2, the land of a zone 3, and the groove of a zone 3. (playback) It carries out. According to this approach, it is the lens actuator 12 (objective lens 10). The seek time which is needed in case it is returned in the direction of inner circumference from a periphery is a groove from a land, although it increases according to the die length of two zones. (from a groove to a land) Since the count of a change is reduced, as the average of seek time, it decreases rather than the example shown in drawing 4.

[0074] That is, in the example shown in drawing 6 and drawing 7, the count of the change from a groove or a groove from a land to a land is made to min. Drawing 8 shows the block of the optical disk with which assignment of the logical address already explained using drawing 4 and drawing 7 was beforehand given as a physical address, and the example of a zone.

[0075] The physical address as the example shown in drawing 7 in the preformat where optical disk D shown in drawing 8 is the same is given. In this case, it records from the block of the physical address 0 of the land of a zone 1, without assigning especially the logical address. (playback) The started lens actuator 12 It is moved to the block of the physical address 10000 of the groove of the block of a physical address 9, next a zone 1. From the block of the physical address 10000 of the groove of a zone 1 to then, record (playback) It starts. It is moved to the block of the physical address 10010 of the groove of the block of a physical address 10009, next a zone 2, and information is recorded further succeedingly in order of the land of a zone 2, the land of a zone 3, and the groove of a zone 3. (playback) It carries out.

[0076] If this optical disk is used, it will be a groove from a land. (from a groove to a land) While the average of seek time including a change is reduced by min, the burden of CPU102 is reduced and the average of seek time is further reduced as a result. This is useful to improvement in an access rate.

[0077]

[Effect of the Invention] According to [ as explained above ] the information record regenerative apparatus of this invention, it is a groove from a land. (from a groove to a land) Informational record since the time amount demanded since an optical head is moved on the occasion of a change is reduced (playback) Sometimes, it is a groove from a land. (from a groove to a land) Even if it is the case where a change is included, the average of seek time is reduced. Reduction of the capacity of buffer memory is attained by this, and the cost of equipment is also reduced.

[0078] Moreover, the time amount which according to the information record regenerative apparatus of this invention is demanded in order that an optical head may return a record section for the change to a land from a groove or a groove from a land, So that the both sides of the switching time for focusing and the tracking which are needed for the change to a land from a groove or a groove from a land may become min Informational record since the block count per one zone is specified (playback) Sometimes, it is a groove from a land. (from a groove to a land) Even if it is the case where a change is included, the average of seek time is reduced.

[0079] Furthermore, the optical disk of this invention is set to a preformat. For the change to a land from a groove or a groove from a land While being specified that the both sides of the switching time for focusing and the tracking which are needed for the change to a land from a groove or a groove from the time amount demanded in order that an optical head may return a record section, and a land become min Since the physical address prescribed that two zones continue is given, a permutation with the logical address, i.e., management of the double address, becomes unnecessary, and the burden of a control unit is reduced. Thereby, an access rate improves further.

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[Translation done.]

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] The schematic diagram showing an example of the optical disk used for land record and groove record.

[Drawing 2] The mimetic diagram which developed the land and groove of an optical disk which were shown in drawing 1.

[Drawing 3] The outline block diagram showing an example of the information record regenerative apparatus which records information on the optical disk shown in drawing 1 and drawing 2, and reproduces information from an optical disk.

[Drawing 4] The schematic diagram showing the example of the logical address assigned to the physical address of an optical disk in the information record regenerative apparatus shown in drawing 3.

[Drawing 5] The schematic diagram showing typically the seek operation based on the logical address shown in drawing 4.

[Drawing 6] The schematic diagram showing typically the seek operation shown in drawing 5, and different seek operation.

[Drawing 7] The schematic diagram showing the example of the logical address assigned to the physical address of an optical disk in order to realize seek operation shown in drawing 6.

[Drawing 8] The schematic diagram showing the address of the optical disk with which the physical address equal to the logical address shown in drawing 7 was preformatted.

### [Description of Notations]

D -- Optical disk

2 -- Optical head equipment,

4 -- Motor,

10 -- Objective lens

12 -- Lens actuator,

14 -- Slide base,

16 -- Linear motor,

30 -- Semiconductor laser component,

32 -- Collimate lens,

34 -- Beam splitter,

36 -- Lens unit,

38 -- Photodetector,

100 -- Optical disk unit

102 -- CPU,

104 -- Internal bus line,

106 -- Memory unit,

110 -- Laser control circuit,

112 -- Linear motor control circuit,

114 -- Video signal processing circuit,

116 -- Focal control circuit,  
118 -- Tracking control circuit,  
120 -- A modulation/demodulator circuit,  
122 -- Motorised circuit,  
124 -- I/O-hardware-control circuit,  
126 -- Timing control circuit,  
128 -- Host interface.

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[Translation done.]



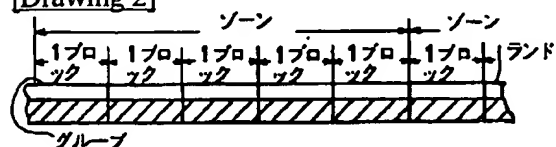
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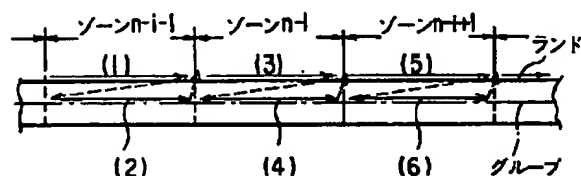
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## DRAWINGS

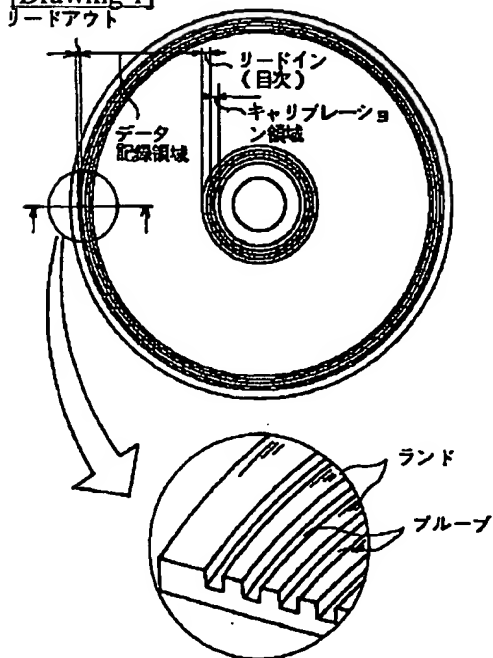
[Drawing 2]



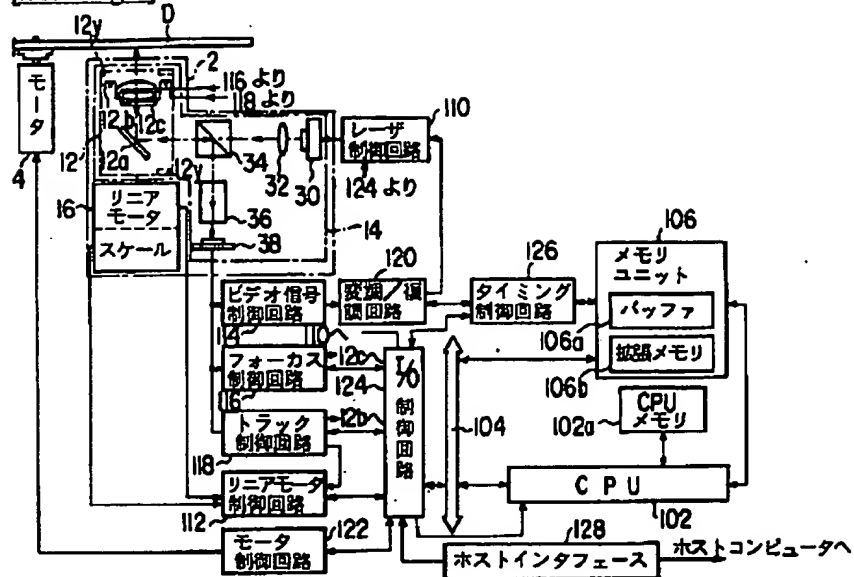
[Drawing 5]



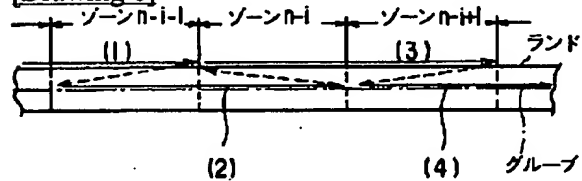
[Drawing 1]



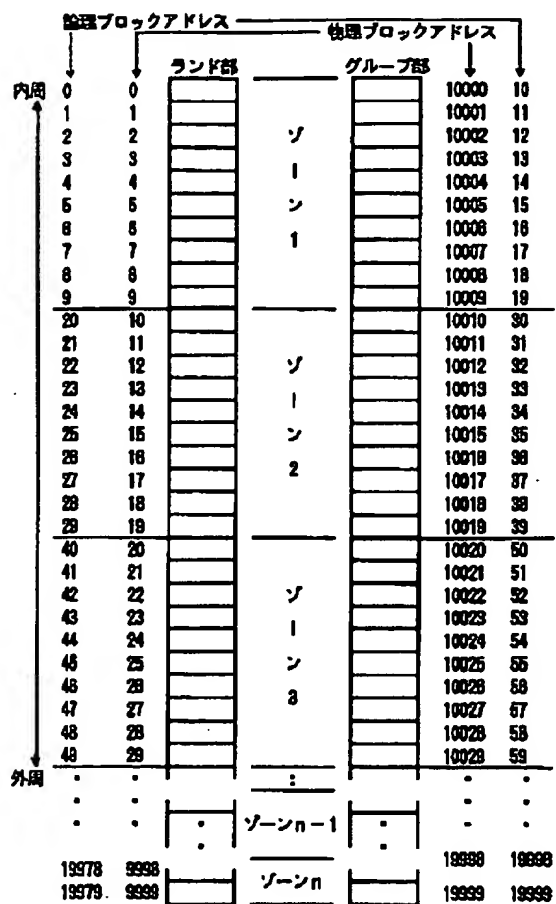
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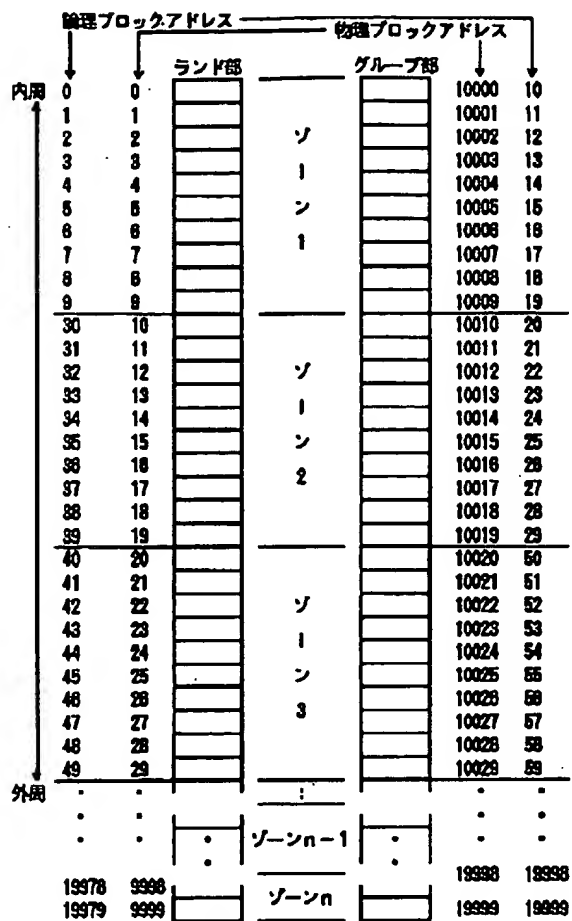
[Drawing 6]



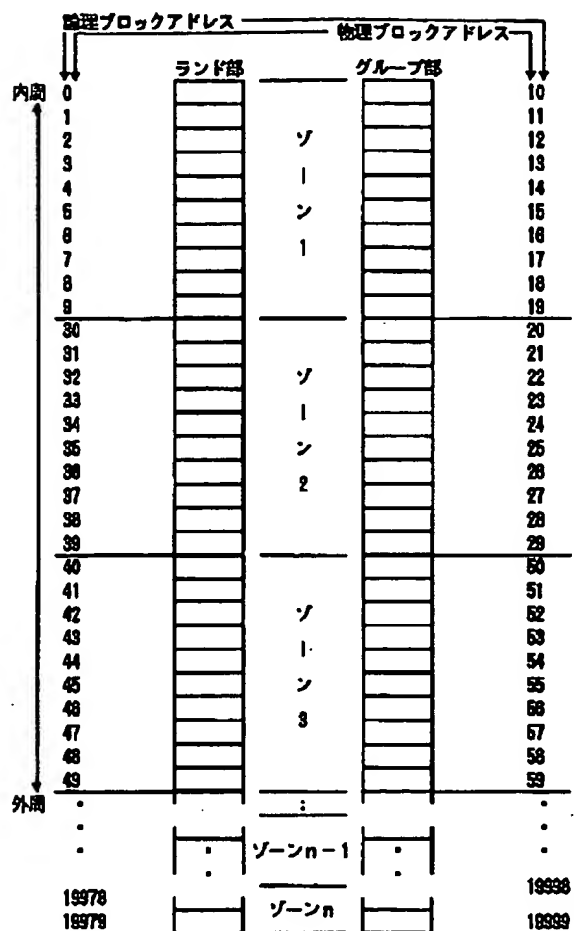
[Drawing 4]



[Drawing 7]



[Drawing 8]



[Translation done.]